

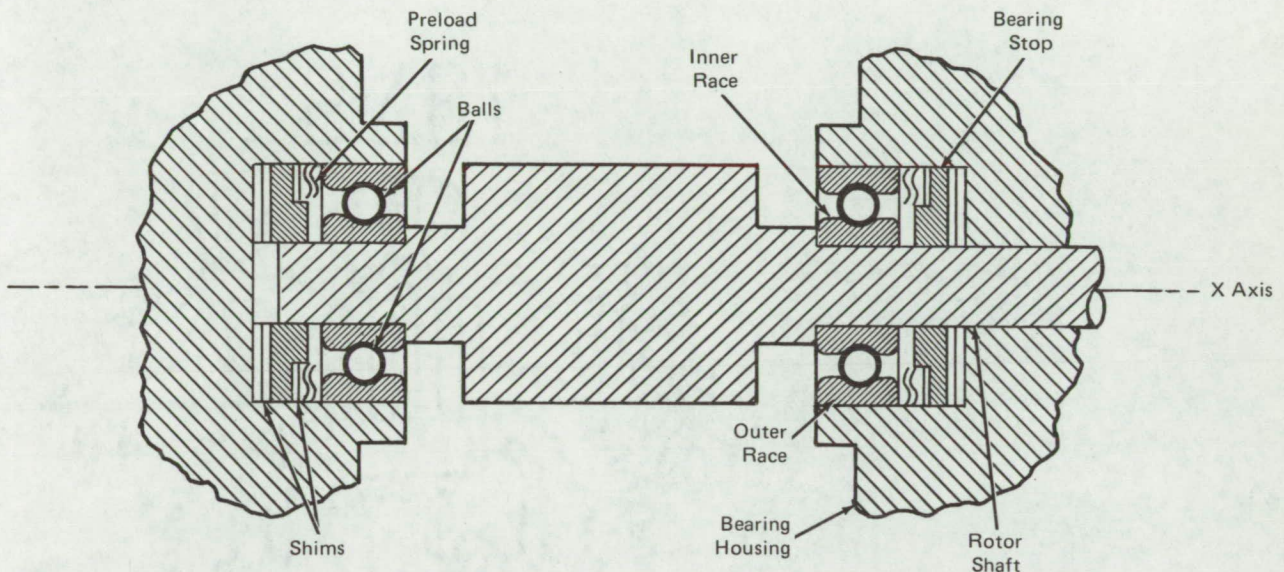
# NASA TECH BRIEF

## Marshall Space Flight Center



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### Ball Bearing Protector



The ball bearing protector (see figure) reduces the stresses imposed on ball bearings when the bearings are exposed to high dynamic forces caused by vibration along the shaft axis (X-axis). The innovation is suitable only for bearings that are inoperative during exposure to the dynamic forces and must operate satisfactorily after removal of these forces.

Using preload springs or blocking the bearings in previous mounting methods exposes the bearings to considerably higher stress under vibration along the shaft axis.

As shown in the cutaway of the bearing protector, the bearing is press fitted on the rotor shaft and slip fitted into the bearing housing. The bearing stop contacts the inner race only and stops the shaft and bearing when moving along the shaft axis, removing the load between the balls and races. The outer race will contact the preload spring just prior to the bearing inner race contacting stop. The amount of contact is dependent upon the preload required.

Conventional bearing configurations with preload springs do not have the bearing stop and would compress the preload spring until the motion is stopped. If the stopping loads are sufficiently high, the preload spring can be overstressed and damage the bearing races and balls.

Shims are used to maintain the desired bearing preload and preload spring deflection which is dictated by the particular bearing, bearing preload, and application. In certain applications where bearing torque and size are critical, use of smaller bearings may be permissible.

#### Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Code A & TS-TU  
Huntsville, Alabama 35812  
Reference: B72-10322

(continued overleaf)

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to:

Patent Counsel  
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